

STOCKPILE REPORT

to the Congress

July - December 1967

**EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF EMERGENCY PLANNING
WASHINGTON, D. C. 20504**

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OFFICE OF THE DIRECTOR

May 9, 1968

Honorable Hubert H. Humphrey
President of the Senate

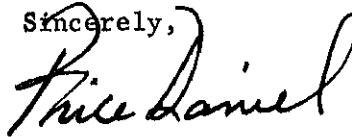
Honorable John W. McCormack
Speaker of the House of Representatives

Sirs:

Pursuant to Section 4 of the Strategic and Critical Materials Stock Piling Act, Public Law 520, 79th Congress, there is presented herewith the semiannual report to the Congress on the strategic and critical materials stock-piling program for the period July 1 to December 31, 1967.

A statistical supplement to this report was transmitted to you on March 11, 1968.

Sincerely,

A handwritten signature in cursive script, reading "Price Daniel". The signature is written in dark ink and is positioned above the printed name and title.

Price Daniel
Director

CONTENTS

	Page
Summary	vi
Introduction	1
Supply-Requirements Studies	1
Summary of Government Inventories of Strategic and Critical Materials	1
Status of Stockpile Objectives	4
Summary of Government Inventories, Objectives, Excesses and Balance of Disposal Authorizations (Basic Stockpile Materials), December 31, 1967	5
Other Materials in Government Inventories.....	8
Summary of Government Inventories and Balance of Disposal Authorizations Covering Materials for Which There Are No Stockpile Objectives, December 31, 1967	8
National Stockpile Activities	9
Procurement and Upgrading	9
Disposal Program Activity	9
Legislation Relative to Stockpile Disposals	10
Disposals of Strategic and Critical Materials (Table)	13
Notes on Strategic and Critical Materials	15
Activities of the General Services Administration	20
Activities of the Department of Commerce	21
Activities of the Department of State	23
Activities of the Department of Agriculture	24
Activities of the Department of the Interior	25
Reports Issued by the Bureau of Mines	26
Reports Issued by the U.S. Geological Survey	27
Total Obligations and Expenditures of Stockpiling Funds, Cumulative and by Fiscal Period Through December 31, 1967	29
Status of Obligational Operations as of December 31, 1967	30
Expenditures of Stockpile Funds, by Type, Cumulative and for First Half Fiscal Year 1968	32

SUMMARY

This report covers the principal activities in stockpile planning and management carried out from July 1 through December 31, 1967, under the provisions of Public Law 520 (79th Congress), the Strategic and Critical Materials Stock Piling Act.

Strategic materials on hand in all Government inventories as of December 31, 1967, amounted to \$6.9 billion at acquisition cost and \$6.6 billion at estimated market value. Of the total materials in Government inventories, \$3.8 billion at cost and \$3.4 billion at estimated market value are considered to be in excess of stockpile objectives. Comparison of the estimated market value of the objectives established and the extent to which materials on hand in all Government inventories meet these objectives are shown in the bar chart on page 4.

In September 1967, the Department of Agriculture discontinued barter transactions for strategic materials except where funds have been appropriated to pay for the surplus agricultural commodities used in acquiring the strategic materials.

Cumulative sales commitments by the General Services Administration for the disposal of surplus materials as of December 31, 1967, totaled approximately \$2.8 billion at sales value. Due to adverse market conditions, disposal sales commitments during July-December 1967 totaled \$85.3 million, the lowest level reported for any six months since December 1963. (See Figures 1 and 2, page 12).

INTRODUCTION

SUPPLY-REQUIREMENTS STUDIES CONVENTIONAL WAR

The revised economic model which is serving as a basis for a review of all conventional war stockpile objectives was completed. This model was made available to cooperating agencies together with updated military requirements. As the year ended,

basic supply-requirements data on a number of materials had been received from responsible agencies and reviewed by interagency commodity committees. It is anticipated that the tempo of this program will be increased in early 1968 and that the reviews of substantially all stockpile materials will have been completed before the end of calendar year 1968.

SUMMARY OF GOVERNMENT INVENTORIES OF STRATEGIC AND CRITICAL MATERIALS

As of December 31, 1967, the strategic materials held in all Government inventories amounted to \$6.9 billion at acquisition cost and \$6.6 billion at estimated market value. Of this total, \$4.4 billion at cost was in the National Stockpile, \$1.5 billion in the Supplemental Stockpile, \$1.0 billion in the Defense Production Act inventory, and \$11.1 million in the Commodity Credit Corporation inventory. Of the total materials in Government inventories, approximately \$3.8 billion at cost and \$3.4 billion at estimated market value are considered to be in excess of stockpile objectives.

The fluctuation in the market price for strategic materials over the past years has greatly enhanced the dollar value of some of the excesses on hand. As a comparison, it is estimated that the market value of surplus materials in Government inventories as of December 1967, has increased approximately 15 percent (\$440.0 million) over the five years since December 1962.

As indicated in previous reports, many factors have contributed to surpluses presently in Government inventories. The change in the strategic war concept from a 5-year to a 3-year mobilization period resulting in a determination to reduce stockpile objectives from a 5-year to a 3-year basis, effective June 30, 1958, materially affected the status of

Government inventories. At that time many materials already on hand had been acquired to meet the 5-year objectives and others were under long-term delivery contracts. With the change from 5-year to 3-year objectives, approximately \$2.8 billion additional materials at cost in Government inventories in June 1958 were made excess to stockpile needs.

In addition, certain existing materials have become excess based on shifts in military planning involving new weapon systems, development of new materials and technological improvements. The National Stockpile also contains (1) nonspecification grade materials, many of which were transferred from other Federal agencies after World War II, and (2) materials removed from the stockpile list as supply-requirements deficits for 3-year conventional war have been overcome while others are no longer considered essential for defense purposes.

Of the current excess of \$3.8 billion at cost, it is estimated that approximately \$315.0 million, or 8 percent, resulted from material acquisitions under special incentive programs enacted by the Congress, but not requested by the Executive Branch of the Government, including:

- (1) The Domestic Minerals Program Extension Act of 1953 (PL 83-206), enacted by the Congress to encourage the

discovery, development, and production of asbestos, beryl, chrome, columbium-tantalum, manganese, mica, and tungsten in the United States and its territories. Total purchases under this program amounted to \$422.3 million, practically all of which was in excess of stockpile requirements.

- (2) The Domestic Tungsten, Asbestos, Fluorspar, and Columbium-Tantalum Production and Purchase Act of 1956 (PL 84-733) directed that a purchase program for these minerals be established by the Department of the Interior until December 31, 1958, or until quota limitations were reached, whichever occurred first. Except for asbestos, the Act provided for premium

prices substantially above market prices. From July 1956 to December 31, 1958, total acquisitions under the Act amounted to approximately \$27.5 million. These materials were in excess of stockpile needs and were subsequently transferred to the Supplemental Stockpile.

The Agricultural Trade Development and Assistance Act of 1954 (PL 83-480) authorizing the barter or exchange of agricultural commodities for strategic or other materials on such terms and under such regulations as the Secretary of Agriculture deemed to be in the public interest has accounted for a substantial quantity of the current excess. In considering PL 480, as amended, it was the expressed opinion of the Congress (Confer-

SUMMARY OF GOVERNMENT INVENTORIES OF STRATEGIC AND CRITICAL MATERIALS

December 31, 1967

	Acquisition Cost	Market Value ¹
I. Total Inventories		
National Stockpile	\$4,388,825,700	\$4,534,725,700
Supplemental Stockpile	1,449,253,200	1,416,223,200
Defense Production Act	1,009,466,200	599,668,400
Commodity Credit Corporation	11,067,300	14,182,700
Total on Hand	6,858,612,400	6,564,800,000
On Order	13,843,400	14,144,000
II. Inventories Within Objective		
Total on Hand	3,100,420,800	3,183,703,300
III. Inventories Excess to Objective		
Total on Hand	3,758,191,600	3,381,096,700

¹ Market values are computed from prices at which similar materials are being traded currently; or, in the absence of current trading, an estimate of the price which would prevail in commercial markets. The market values are generally unadjusted for normal premiums and discounts relating to contained qualities. The market values do not necessarily reflect the amount that would be realized at time of sale.

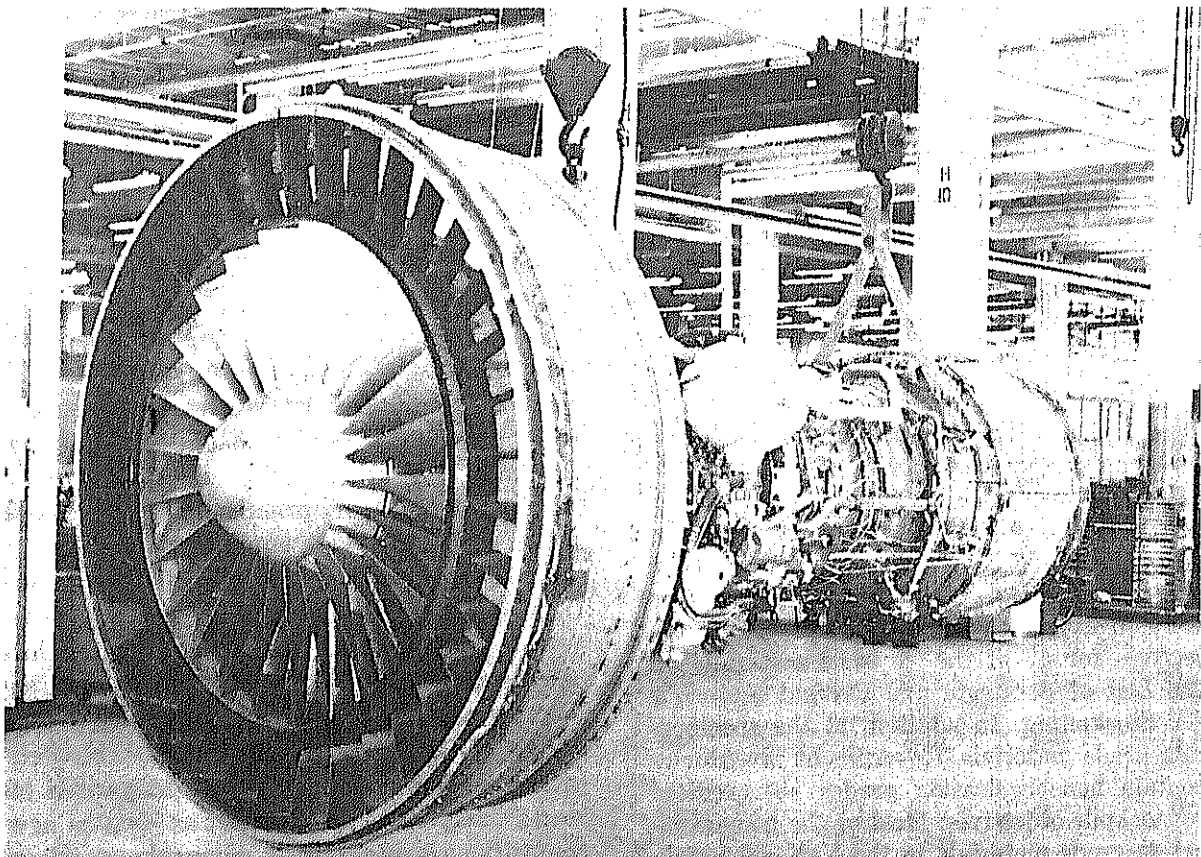
Source: General Services Administration

ence Report No. 2694, August 22, 1958) that it would be to the benefit of the U.S. to exchange surplus agricultural commodities which deteriorate in value and are costly to store for strategic and other materials of a type which might be needed by the U.S. either in time of emergency or in its normal economy as world supplies of these materials decrease.

Since the inception of the barter program, strategic materials, valued at \$1.6 billion at cost, have been delivered to the Commodity Credit Corporation. Of this total, \$223.3 million were transferred to the National Stockpile and about \$1.4 billion to the Supplemental Stockpile. Of this latter amount, approximately \$750.0 million are excess to stockpile needs as of December 31, 1967.

About 83 percent of the market value of the total current excess (\$3.4 billion) is made up of 12 materials consisting of aluminum, bauxite (Jamaica and Surinam), metallurgical grade chromite, cobalt, industrial diamond stones, lead, metallurgical grade manganese, nickel, rubber, tin, tungsten, and zinc.

The table on page 2 is a summary of the total value of all materials carried in Government inventories, including those with quantities in excess of established stockpile objectives. It indicates the acquisition cost and estimated market value of materials with inventories meeting stockpile objectives, and materials with inventories excess to stockpile objectives.



GE TF 39 turbofan engine designed for new C-5A cargo plane. Critical fan and compressor components are fabricated of titanium alloy, reducing the overall engine weight by 18 percent.

STATUS OF STOCKPILE OBJECTIVES

The bar chart below shows the estimated market value of the objectives established and the extent to which materials on hand in all Government inventories (National Stock-

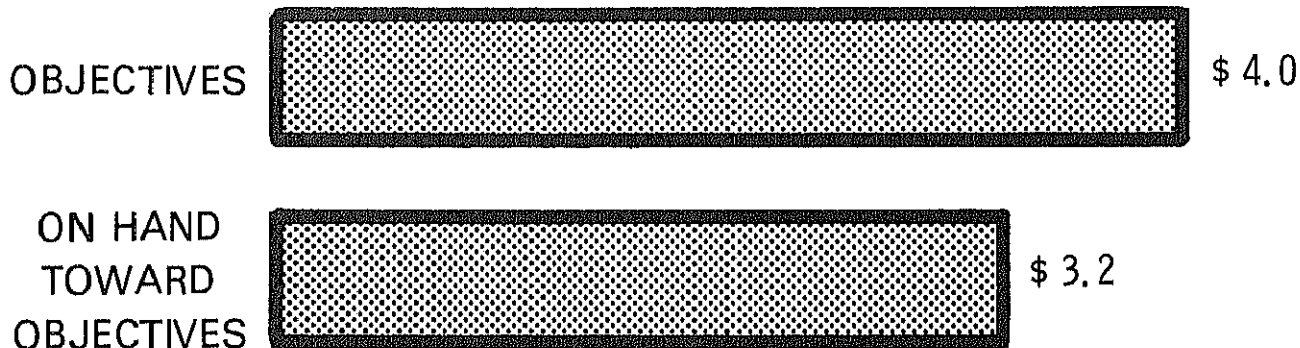
pile, Supplemental Stockpile, DPA, and CCC) meet these objectives. The figures do not include the quantities on hand in all Government inventories which are in excess of stockpile objectives (\$3.4 billion).

STATUS OF STOCKPILE OBJECTIVES

AS OF DECEMBER 31, 1967

(In Billions of Dollars)

Market Value



The objective, inventory, excess, and balance of disposal authorizations, for each material on the Strategic and Critical Materials List are shown in the following summary. As of December 31, 1967, total quantities of stockpile grade materials on hand and on order for all Government-owned inventories were in excess or equal to the stockpile objectives for 66 of the 77 basic materials on the List of Strategic and Critical Materials for Stockpiling. In addition to the specification grade materials, Government inventories contain nonspecification grades not credited to stockpile objectives. Most of the nonspecification grade materials in the National Stockpile were acquired by the transfer of Government-owned surpluses to the stockpile after World War II while others were accepted as contract termination inventories. Several

were of specification grade when acquired but no longer qualify due to changes in industry practices and other technological advances. Disposal action for practically all excesses shown in the following summary has been authorized by the Congress or, in the case of DPA materials, by the OEP. There are, however, a few materials for which disposal has been deferred pending new supply-requirements studies or improvement in market conditions. Certain technologically obsolete grades of materials now in inventory will be transferred to the disposal list as soon as new acquisitions are made of currently standard qualities. Inventory changes during the report period were due primarily to disposals, or to reclassification and other adjustments in the inventories.

SUMMARY OF GOVERNMENT INVENTORIES, OBJECTIVES,
EXCESSES AND BALANCE OF DISPOSAL AUTHORIZATIONS

Basic Stockpile Materials
As of December 31, 1967

(Market Value—\$ Millions)

Commodity	Unit	Objective	Total Inventory ^{1 2}	Market Value	Excess ²	Market Value	Balance of Disposal Authorization
1. Aluminum	ST	450,000	1,501,696	\$750.8	1,051,696	\$525.8	1,045,453 ³
2. Aluminum oxide, fused	ST	300,000	429,265	69.8	129,265	18.6	129,265
3. Antimony	ST	25,500	49,371	42.6	23,871 ⁴	20.2	2,623
4. Asbestos, amosite	ST	40,000	65,805	13.9	25,805	5.5	14,301
5. Asbestos, chrysotile	ST	13,700	15,684	6.7	5,228 ⁴	1.2	1,830
6. Bauxite, metal, Jamaica	LDT	5,000,000	8,858,881	103.1	3,858,881 ⁵	44.9	714,000
7. Bauxite, metal, Surinam	LDT	5,300,000	7,889,967	121.1	2,589,967 ⁵	39.8	0
8. Bauxite, refractory	LCT	173,000	221,631	9.3	48,631	2.0	916
9. Beryl	ST	28,000	49,745	67.8	21,745 ⁶	12.5	0
10. Bismuth	LB	2,400,000	3,812,315	15.2	1,412,315	5.6	1,135,500
11. Cadmium	LB	5,100,000	13,749,174	34.8	8,649,174 ⁷	21.9	3,511,792
12. Castor oil	LB	22,000,000	111,587,041	24.3	89,587,041 ⁵	18.8	31,051,382
13. Celestite	ST	10,300	45,910	1.1	35,610	.7	28,811
14. Chromite, chemical	SDT	600,000	1,059,301	27.4	459,301 ⁸	11.9	116,458
15. Chromite, metallurgical	SDT	2,970,000	6,158,829	411.0	3,188,829 ⁹	267.1	1,170,617
16. Chromite, refractory	SDT	1,425,000	1,426,671	21.7	1,671	.02	0
17. Cobalt	LB	42,000,000	95,249,020	161.9	53,249,020 ¹⁰	90.5	17,517,050
18. Columbium	LB	1,176,000	13,294,771	20.8	12,118,771 ¹⁰	18.7	5,383,746
19. Copper	ST	775,000	282,243	220.4	0	0	0
20. Cordage fibers, abaca	LB	50,000,000	129,830,161	20.1	79,830,161	12.4	74,132,206
21. Cordage fibers, sisal	LB	200,000,000	247,021,206	18.5	47,021,206	3.5	35,576,274
22. Corundum	ST	2,500	1,964	.2	1,952 ⁵	.2	0
23. Diamond dies, small	PC	25,000	15,777	.6	442 ¹¹	.02	0
24. Diamond, industrial bort	KT	24,700,000	42,574,379	98.1	17,874,379 ¹²	42.0	0
25. Diamond, industrial stones	KT	16,500,000	26,736,682	363.8	10,236,682 ⁹	131.6	1,769,650
26. Feathers and down	LB	3,000,000	4,016,735	13.2	1,016,735	1.8	0
27. Fluorspar, acid grade	SDT	540,000	1,140,948	54.8	250,948 ^{9 13}	11.7	6,067

Commodity	Unit	Objective	Total Inventory ^{1 2}	Market Value	Excess ²	Market Value	Balance of Disposal Authorization
57. Quinine	OZ	4,130,000	3,548,161	\$ 3.4	0	\$ 0	0
58. Rare earths	SDT	3,000	15,788	5.7	12,788 ¹⁸	4.6	7,321
59. Rubber	LT	130,000	479,344	190.6	349,344	138.9	338,364
60. Rutile	SDT	200,000	47,617	5.7	0	0	0
61. Sapphire and Ruby ...	KT	18,000,000	16,308,797	.2	0	0	0
62. Selenium	LB	475,000	425,739	1.9	0	0	0
63. Shellac	LB	8,300,000	13,641,946	4.2	5,341,946	1.0	4,497,502
64. Silicon carbide, crude	ST	30,000	196,453	43.0	166,453 ⁴	36.5	0
65. Silver	FineTrOz	165,000,000	¹⁹		0	0	0
66. Sperm oil	LB	23,400,000	23,481,738	4.1	81,738 ⁷	.01	0
67. Talc, steatite block & lump	ST	200	1,244	.4	1,044	.3	1,044
68. Tantalum	LB	3,400,000	3,988,324	51.3	²⁰		0
69. Thorium oxide	LB	500,000	500,000 ²¹	2.1 ²¹	0	0	0
70. Tin	LT	200,000	261,324	901.5	61,324	211.5	60,636
71. Titanium sponge	ST	37,500	29,732	71.3	0	0	9,231
72. Tungsten	LBW	44,000,000	188,976,525	519.3	144,976,525	399.4	62,093,950
73. Vanadium	ST	1,500	5,609	25.2	4,109	17.9	3,972
74. Vegetable tannin, chestnut	LT	15,000	33,527	9.9	18,527	5.5	18,519
75. Vegetable tannin, quebracho	LT	86,000	196,285	39.6	110,285	22.2	109,627
76. Vegetable tannin, wattle	LT	15,000	38,917	6.8	23,917	4.2	23,887
77. Zinc	ST	0	1,198,122	335.5	1,198,122 ⁴	335.5	107,059

¹ Total inventory consists of stockpile and nonstockpile grades.

² Includes quantities that have been committed for sale but not shipped, as well as quantities of nonstockpile quality materials which may be held toward objectives.

³ Committed for sale but undelivered under long-term contracts.

⁴ Unauthorized balance of excess held due to market impact.

⁵ Balance of excess pending Congressional approval.

⁶ 9,888 short tons pending Congressional approval. Excess quantity includes (i) 3,617 ST in beryllium copper master alloy and 2,080 ST in beryllium metal, and (ii) the amount held in the CCC inventory.

⁷ Balance of excess pending supply-requirements study.

⁸ Balance of excess retained due to high quality.

⁹ Balance of excess deferred by the Congress due to market impact.

¹⁰ Unauthorized excess held pending completion of present sales program on DPA material.

¹¹ Retained due to limited quantity.

¹² Deferred due to foreign situation.

¹³ Excludes 350,000 SDT credited to metallurgical fluorspar.

¹⁴ Factory inspecting feasibility of reworking bearings to meet stockpile specifications.

¹⁵ Includes high carbon ferromanganese. Also includes quantity of metallurgical manganese ore retained for strategic reasons.

¹⁶ Excludes 564,750 LBS credited to mica, muscovite film.

¹⁷ Quantity being held for upgrading.

¹⁸ 5,148 SDT pending supply-requirements study.

¹⁹ Under PL 90-29, objective will be filled in June 1968 from stocks currently held by the Treasury.

²⁰ Takes into consideration materials required in upgrading.

²¹ Includes 1,086,960 LBS thorium nitrate credited as 500,000 LBS thorium oxide, \$2.1 million market value.

OTHER MATERIALS IN GOVERNMENT INVENTORIES

Inventories covering materials that have been removed from the stockpile list, and

others for which there are no stockpile objectives, are indicated in the table below. These are not included in the previous tabulation.

SUMMARY OF GOVERNMENT INVENTORIES AND BALANCE OF DISPOSAL AUTHORIZATIONS COVERING MATERIALS FOR WHICH THERE ARE NO STOCKPILE OBJECTIVES

As of December 31, 1967

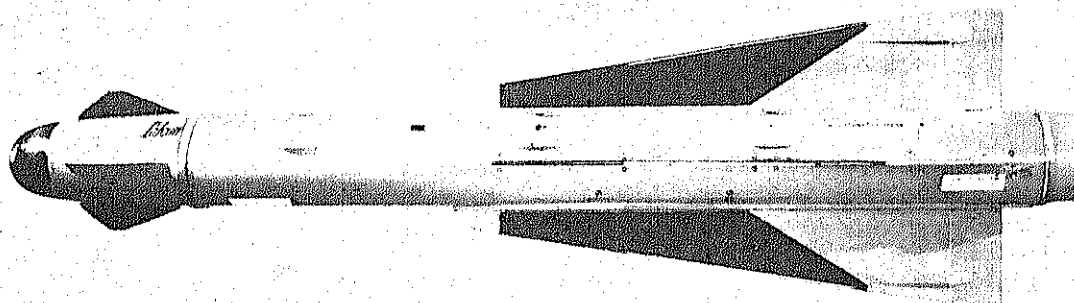
(Market Value—\$ Millions)

Commodity	Unit	Total Inventory ¹	Market Value	Balance of Disposal Authorizations
Antimonial lead	ST	10,487	\$ 3.1	9,394
Asbestos, crocidolite	ST	48,261	11.1	47,273
Colemanite	LDT	67,571	.6	0
Cryolite	ST	1,279	.2	0
Diamond tools	PC	64,178 ²	.8	0
Mica, muscovite block, St. B/Lower	LB	4,320,202	8.6	4,320,202
Mica, muscovite film, 3rd quality	LB	469,018	3.2	469,018
Platinum group metals, ruthenium	TrOz	11,999	.5	11,999
Silk noils	LB	45,112	.03	0
Talc, steatite ground	ST	3,900	.02	3,900
Thorium nitrate (oxide content)	LB	7,910,569 ³	15.3	3,138,861
Zirconium ore, baddeleyite	SDT	16,514	.7	16,514
Zirconium ore, zircon	SDT	1,721	.002	1,721

¹ Includes quantities that have been committed but not shipped.

² Deferred due to market impact.

³ Includes 1,086,960 pounds credited to thorium oxide objective, \$2.1 million market value.



JAR-1-2,-3 Missile is magnesium.

NATIONAL STOCKPILE ACTIVITIES

PROCUREMENT AND UPGRADING

The OEP Strategic Stockpile Procurement Directive for FY 1968, issued November 9, 1967, provides for cash procurement of two

million pieces of jewel bearings from the Federal facility at Rolla, North Dakota, the exchange of excess materials for 249,948 troy ounces of palladium pursuant to Public Law 89-390 and five upgrading actions as follows:

<i>Material</i>	<i>Unit</i>	<i>Quantity</i>
Columbium, ferro	LB-Cb	186,000
Manganese, silico	ST	25,000
Platinum group, Iridium	TrOz (up to)	300
Platinum group, Palladium	TrOz (up to)	10,000
Tungsten, ferro	W-LB	300,000

These projects are in various stages of development, but no contracts had been let by December 31, 1967.

1. *Jewel bearings.* During July-December 1967, the Bulova Watch Company, Inc., produced 1,300,377 bearings at the William Langer Jewel Bearing Plant at Rolla, North Dakota, under the stockpile contract and lease for the property which have a current expiration date of June 30, 1968. Of this quantity, 759,461 pieces were for the stockpile and 540,916 for defense contractors. With the experience being gained from the utilization of the modern equipment, production efficiencies continue to rise. Production levels now approach 60,000 bearings per week with no increase in manpower required. Further increases can be achieved if sufficient orders become available. Proposed legislation for authorizing improved methods for the operation of the plant was cleared by the Bureau of the Budget and was submitted to Congress on December 1, 1967.

2. *Ferromanganese—Palladium.* On August 31, 1967, a contract was entered into for the conversion of Government-furnished manganese ore to 36,000 short tons of medium carbon ferromanganese for delivery not later than June 30, 1971. Payment for services performed will be made in excess materials from the stockpile. The contract also provides for

the acquisition of 200,000 troy ounces of palladium for delivery by June 30, 1968. Payment for this material is being made in excess stockpile materials pursuant to the provisions of PL 89-390. Palladium deliveries under the contract as of December 31, 1967, totaled 104,856 troy ounces.

3. *Morphine Sulfate on Order Prior Fiscal Year—(1967).* The processing of gum opium to morphine sulfate is continuing under a previous processing contract with recovery of morphine sulfate under the contract to date at 25,662 pounds.

4. *Tungsten Metal Powder hydrogen reduced.* Delivery of 250,000 pounds of hydrogen reduced tungsten metal powder under a contract for the conversion of Government-furnished tungsten will be completed early in 1968. Payment for the powder will be made with excess tin from the stockpile.

DISPOSAL PROGRAM ACTIVITY

Due to generally adverse market conditions, disposal sales of surplus strategic materials during the July-December period were at the lowest level reported for any six months since December 1963. Sales totaled \$85.3 million compared with \$262.2 million for the previous six months (January-June 1967) and \$204.7 million for the corresponding July-December last year. Approximately 59 commodities

were available for disposal from Government inventories, including silver, the sale of which GSA began on August 4, 1967, on behalf of the Department of the Treasury. Of the 59 materials available, sales of only 34 were made during the period. Although GSA sales activities were intensified, exhaustion of large quantities of readily salable materials, prolonged labor strikes, and lower productive demands contributed to the decreased rate. As indicated in previous reports, disposal programming of most surpluses in Government inventories has been completed except for those strategic materials where action awaits the outcome of supply-requirements studies, Congressional approval, or improvement in market conditions. While no new disposal programs were approved by OEP during the report period, a constant review of current programs was maintained in accordance with policies set forth in Defense Mobilization Order 8600.1 to safeguard and protect the mutual interests of industry, foreign countries, and the U. S. Government. As a result, sales plans and related matters were reviewed in consultation with interested agencies with respect to beryl, columbium, industrial diamond bort, mica (muscovite and phlogopite), molybdenum, and ruthenium. Sales action on industrial diamond bort was deferred pend-

ing further review of contractual arrangements made at the time of acquisition.

LEGISLATION RELATIVE TO STOCKPILE DISPOSALS

During November 1967, three proposed legislative bills submitted by GSA in February were enacted by the Congress authorizing the disposal of bismuth, molybdenum, and rare earths, valued at \$32.5 million, from the National and/or Supplemental Stockpiles.

Three other materials approved for disposal by OEP in early 1967, covering excess beryl, castor oil, and corundum, valued at \$11.6 million, were submitted for Congressional consideration in August.

As of December 31, 1967, seven proposed bills were pending final action by the Congress. Of these, beryl, magnesium, and platinum received final House action and were referred to the Senate on December 14, 1967. There has been no action on the castor oil and corundum proposals. The nickel bill, involving \$55.5 million, passed the House on April 20, 1967, but was adversely reported by the Senate Armed Services Committee on June 8, 1967. The status of disposal legislation at December 31 is indicated in the following table:

DISPOSAL LEGISLATION PROPOSED TO THE 90TH CONGRESS

Material	Unit	Quantity	Value (\$ Millions)	Bill No.	Date
Enacted Legislation					
Bismuth	LB	1,200,000	\$ 4.8	H.R. 5788 (PL-153)	11-24-67
Molybdenum	LB	15,000,000	24.3	H.R. 5784 (PL-151)	11-24-67
Rare earths	SDT	7,640	3.4	H.R. 5787 (PL-152)	11-24-67
	Total		<u>\$ 32.5</u>		
Legislation Passed by House Pending in Senate					
Beryl ore	ST	9,888	\$ 3.0	H.R. 14367	12-14-67
Magnesium	ST	55,000	35.2	H.R. 5785	12-14-67
Nickel	LB	60,000,000	55.5	H.R. 5786	4-20-67
Platinum	TrOz	115,000	12.6	H.R. 5789	12-14-67
	Total		<u>\$106.3</u>		

Material	Unit	Quantity	Value (\$ Millions)	Bill No.	Date
Legislation Proposed But Not Yet Introduced					
Bauxite, metallurgical	ST	5,400,000	\$ 71.1	H.R. 7185 ²	8-14-67
Castor oil	LB	46,000,000	8.8	—	8-25-67
Corundum	ST	1,952	0.8	—	8-25-67
		Total	79.7		
		Total legislation items pending	186.0		

¹ Nickel disposal bill approved by House on April 20, 1967, but adversely reported by the Senate Armed Services Committee on June 8, 1967.

² Private bill introduced by Congressman Wilson. No action taken.

SALES COMMITMENTS

Sales commitments totaled \$85.3 million at market value for the six months July-December 1967—the lowest for any six month period since 1963. Of the total, approximately \$51.5 million were from the National and Supplemental Stockpiles, \$8.3 million from the Defense Production Act inventory and about \$25.5 million from "other sales." "Other sales" consist of approximately \$4.0 million of mercury from the Federal Property Act inventory, and \$21.5 million which GSA realized in excess of the U.S. monetary value

(\$1.2929 per ounce) from the sales of approximately 43.1 million ounces of silver, valued at \$77.3 million, on behalf of the Treasury Department.

Sales commitments for the previous six months were \$262.2 million, bringing the total for calendar year 1967 to \$347.5 million. Since the inception of the disposal program in 1958, total sales approximate \$2.8 billion (Figures 1 and 2).

A list of the materials sold during the July-December period is shown in the following table:

Figure 1

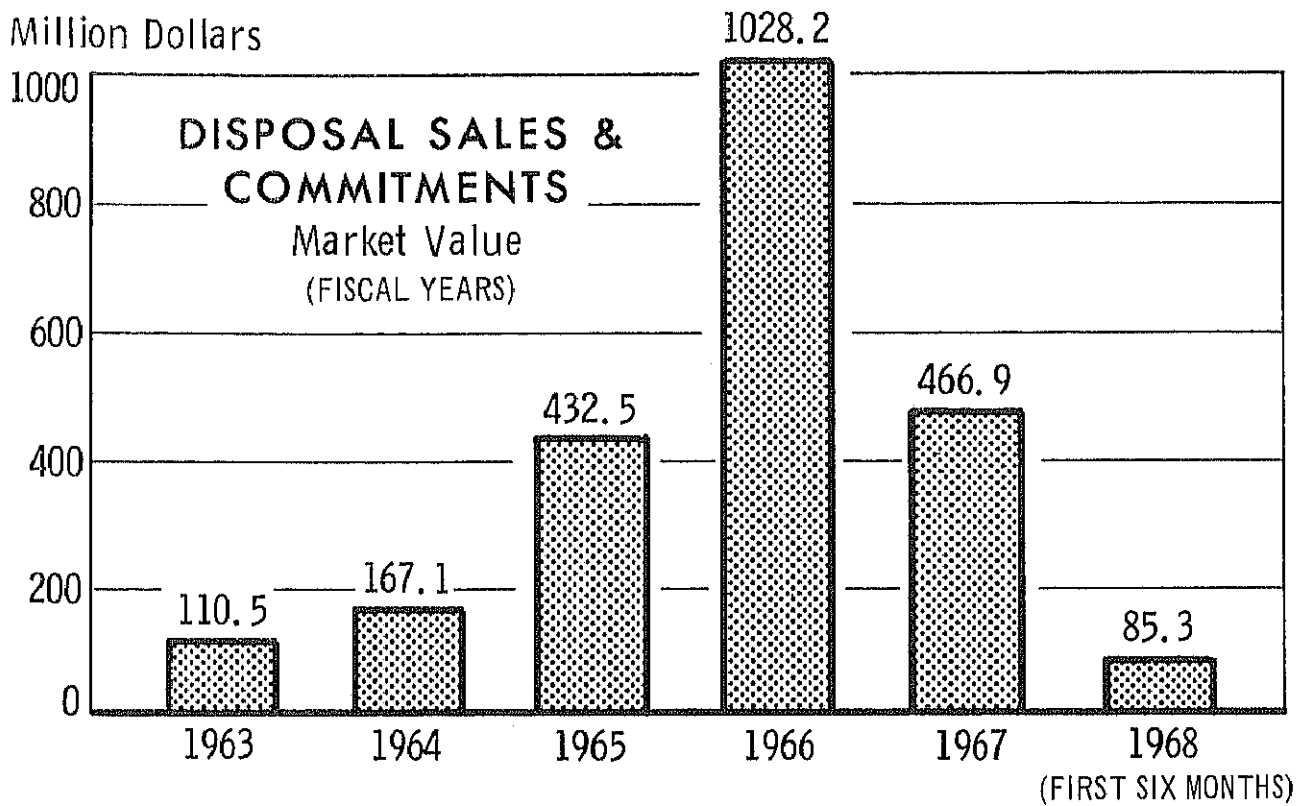
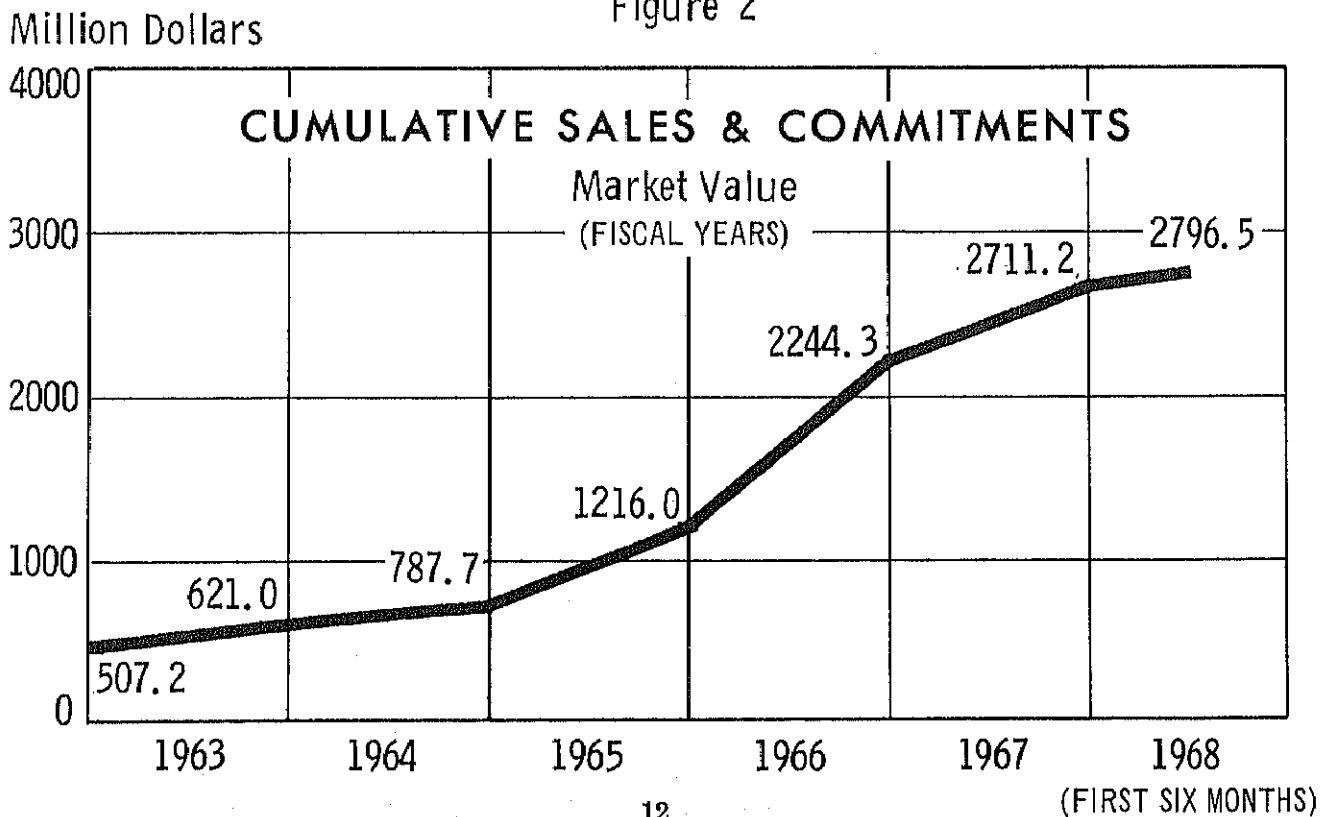


Figure 2



DISPOSALS OF STRATEGIC AND CRITICAL MATERIALS

July—December 1967

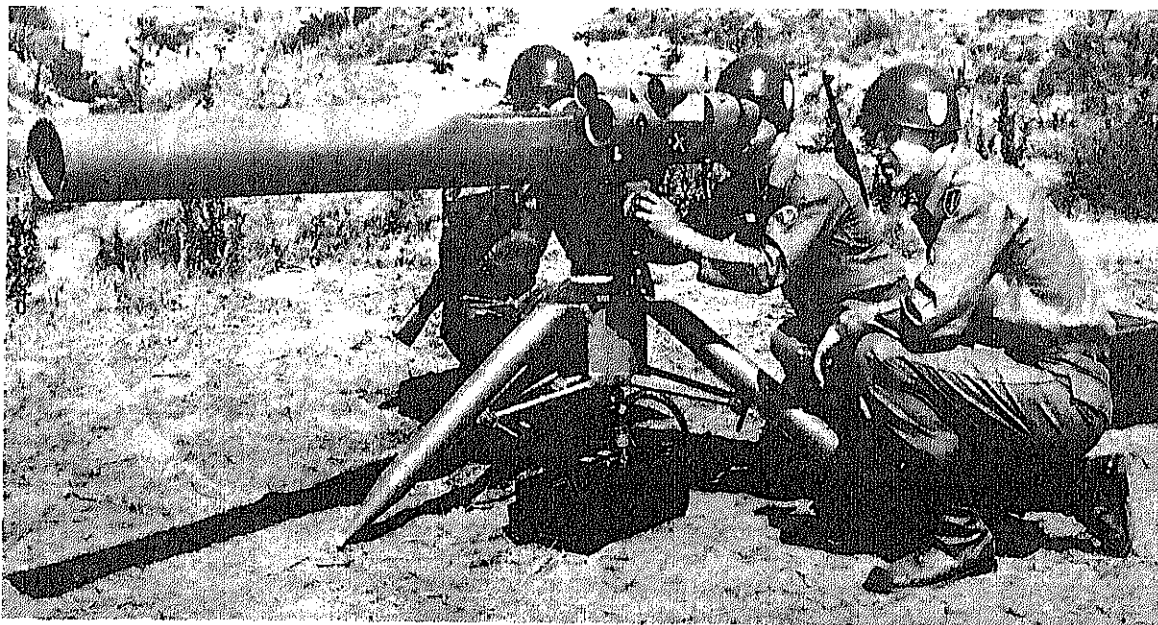
Material	Unit	Quantity	Sales Commitments		
			Government Use	Industrial Use	Total Sales Value
NATIONAL AND SUPPLEMENTAL STOCKPILE INVENTORIES:					
Aluminum	ST	511	\$	\$ 255,419	\$ 255,419
Antimony	ST	20		11,500	11,500
Asbestos, amosite	ST	300		52,800	52,800
Asbestos, crocidolite	ST	100		19,000	19,000
Bauxite, refractory	LCT	48,500		1,988,825	1,988,825
Bismuth	LB	64,500		258,075	258,075
Cadmium	LB	104,300		264,044	264,044
Castor oil	LB	23,252,136		4,780,756	4,780,756
Colemanite	LDT	67,506		624,893	624,893
Cordage fiber, abaca	LB	7,026,756	501,717	389,118	890,835
Cordage fiber, sisal	LB	20,008,718	7,909	1,443,045	1,450,954
Diamond stones, industrial	KT	30,350		285,952	285,952
Graphite, Malagasy	ST	50		5,750	5,750
Lead	ST	11,002	180,589	2,858,530	3,039,119
Manganese, metallurgical	SDT	293,423		7,796,044	7,796,044
Mica	LB	6,187		12,382	12,382
Molybdenum	LB	1,349,663		2,334,034	2,334,034
Nickel	LB	—	3,645,181*	—	3,645,181
Platinum group metals:					
Ruthenium	TrOz	1,700	3,963	62,146	66,109
Quartz crystals	LB	34,166	14,300	140,345	154,645
Rare Earths	SDT	319		131,446	131,446
Rubber	LT	36,935	14,490,123		14,490,123
Shellac	LB	631,626		85,516	85,516
Talc	ST	10		1,600	1,600
Tin	LT	1,575	222,428	5,178,212	5,400,640
Vegetable Tannin:					
Quebracho	LT	704	10,080	181,301	141,381
Wattle	LT	25		4,270	4,270
Zinc	ST	11,493	3,273,181**	15,619	3,288,800
Total National and Supplemental Stockpiles			\$22,349,471	\$29,130,622	\$51,480,093

*Represents price increase between date sales committed and delivered.

**Includes AID sales of 7,337 ST at a value of \$2,115,622.

Material	Unit	Quantity	Sales Commitments		Total Sales Value
			Government Use	Industrial Use	
DEFENSE PRODUCTION ACT INVENTORY:					
Aluminum	ST	1,580		\$ 771,212	\$ 771,212
Asbestos, chrysotile	ST	106		17,145	17,145
Cobalt	LB	2,083,972		3,512,232	3,512,232
Manganese, metallurgical	SDT	14,499		235,450	235,450
Nickel	LB	—		902,950	902,950
Titanium	ST	133		278,735	278,735
Tungsten	LBW	1,045,836		2,581,265	2,581,265
TOTAL DPA				\$ 8,298,989	\$ 8,298,989
OTHER					
Mercury	FL	8,036	\$ 1,301,224	\$ 2,718,408	\$ 4,019,632
Silver ¹	(fine) TrOz			21,510,666	21,510,666
Total OTHER			\$ 1,301,224	\$24,229,074	\$25,530,298
GRAND TOTAL			\$23,650,695	\$61,658,685	\$85,309,380

¹ Represents that portion of the total proceeds in excess of the U.S. monetary value based on \$1.2929 per ounce. 48,151,860 ounces of silver were sold at an average price of \$1.7913.



Anti-tank weapon (TOW) developed with 18 percent nickel maraging steel.

NOTES ON STRATEGIC AND CRITICAL MATERIALS DISPOSAL ACTIVITIES JULY-DECEMBER 1967

Aluminum

Sales commitments of primary aluminum under the November 1965 long-term producers' purchase agreements showed a precipitous drop in the July-December period—totaling only 2,041 short tons, valued at \$1.0 million, compared with 43,711 tons returning \$21.7 million for the previous six months and 83,875 tons, valued at \$41.3 million, in July-December 1966. This decline reflects the fact that market demands for aluminum did not increase as anticipated although domestic production continued to grow during the period. As of the end of the year, cumulative sales since the inception of the sales program amount to 403,046 tons, valued at \$198.4 million, leaving approximately 1,045,453 tons to be taken pursuant to Government contracts with the major producers.

Castor Oil

Bimonthly offerings of castor oil showed continued strength in the report period. All of the 23.3 million pounds offered in July through December were sold, realizing \$4.8 million for the Government. In the earlier six months, 19.5 million pounds were sold, valued at approximately \$3.2 million. Since sales of castor oil were authorized in August 1962, approximately 124.6 million pounds, valued at \$19.5 million, have been sold, leaving about 31.0 million pounds to be sold under the 1962 authorization. Legislation for the disposal of an additional 46.0 million pounds has been proposed and awaits Congressional consideration.

Cobalt

The domestic supply-demand situation of cobalt eased substantially during the period with Government sales dropping to nearly half the previous six months—2.1 million pounds, valued at \$3.5 million, compared with 3.9 million pounds, valued at \$6.6 million, for January-June. Settlement of the Congolese

export embargo of cobalt (effective December 1966 through February 1967) relieved the critical foreign supply and domestic market situation. Export restrictions placed on U.S. Government sales in February 1967 were lifted starting July. Cumulative sales since the inception of the 25 million pounds release from the Defense Production Act inventory in August 1966 amount to about 7.5 million pounds with a return of \$12.5 million to the Government. All 1967 sales were made off-the-shelf at prevailing market prices.

Copper

On March 29, 1966, the President, acting on recommendations of the Director of OEP, issued a determination that it was essential in the interest of national security that additional capacity for the production of copper in the United States be developed to meet expanding industrial requirements.

Accordingly, OEP authorized the General Services Administration to undertake a domestic expansion program within the \$100 million limitation stipulated under Section 304(b) of the Defense Production Act, as amended.

Following extensive negotiations involving the evaluation of over 140 proposals received in response to the Government's inquiry, GSA entered into a contract on November 28, 1967, with the Duval Sierrita Corporation, a subsidiary of the Duval Corporation of Houston, Texas, to develop a large open-pit copper mine in Pima County, Arizona.

Under the project, a total of \$151 million will be expended to bring in a total of 1.3 million tons of refined copper over a 20-year period from the new mine developed under the contract. Of the total to be invested in the project, \$83 million will be advanced by GSA. The Corporation will repay this advance with deliveries of copper to the Government at 38 cents per pound. In addition, \$48.8 million will be furnished by a privately obtained loan which GSA will guarantee at an initial rate

of 70 percent of the principal. The Duval Corporation will supply the balance of \$15.7 million in addition to approximately \$3.5 million already spent on the project. Under the contract, the company will be required to obtain the initial capital required from private sources since the first Government money will not be advanced until August 1968. The GSA advances are interest-bearing, and interest will be paid quarterly in cash during the life of the contract at the rate of 6 percent per annum. The repayment schedule provides that Government advances would be repaid first (by June 30, 1975), then the GSA guaranteed private loan, and finally the funds which are to be supplied by the Duval Corporation. After about five years, the company plans to produce approximately 68,000 tons of copper annually over a 15-year period. In addition, the mine is expected to produce approximately 12 million pounds of molybdenum and 455,000 ounces of silver annually.

On June 30, 1967, the majority of labor contracts in the copper industry expired. On July 15, 1967, the United Steel Workers of America and the Mine, Mill, and Smelters Union began a strike which closed most of the copper mines, mills, smelters, refineries, and some of the lead-zinc mines, smelters, and refineries.

A small number of brass mills and copper wire mills, principally subsidiaries of the

major integrated companies, were also closed. The strike was still in effect at the close of 1967 when 90 percent of the copper mines, 97 percent of the smelters, and 87 percent of the refineries were still closed.

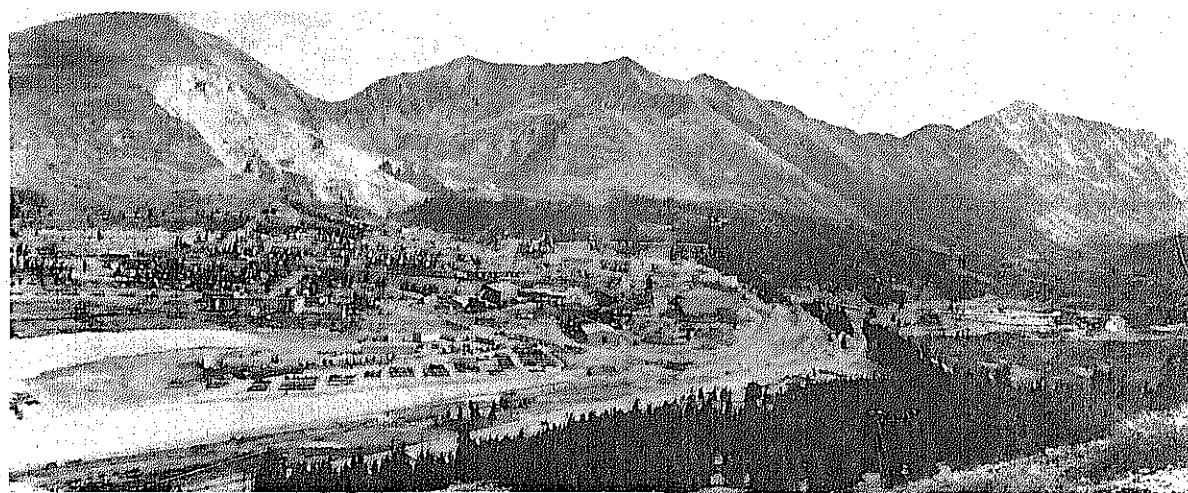
The strikes also affected the domestic production of silver as copper mines normally account for about one-third of the U.S. production of that metal.

Lead

Lead sales picked up during the six months ending December 31, 1967, totaling 11,002 short tons, valued at \$3.0 million, nearly double the prior six months total of 5,723 short tons, valued at \$1.7 million.

Molybdenum

On November 30, 1967, GSA announced the offering of approximately 15 million pounds of excess molybdenum from the National Stockpile on a shelf-item basis under disposal authority granted by Public Law 90-151, enacted November 24, 1967. This offering is in addition to approximately 2.6 million pounds of molybdenum remaining to be allocated by the Business and Defense Services Administration under a previous authorization, Public Law 89-413 of May 1966. Due to earlier commitments, disposition of this program will continue on an allocation basis until completed.



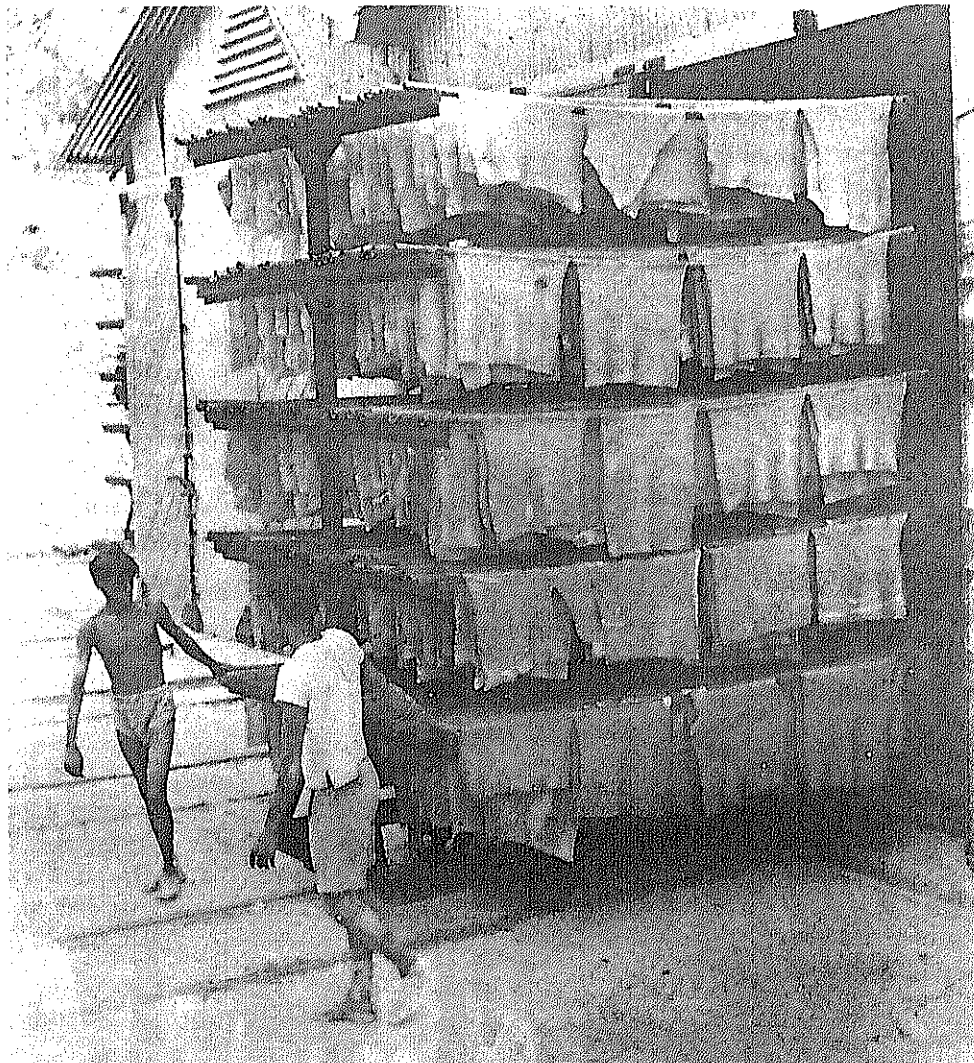
Large facility for the production of molybdenum used extensively in high speed steels, armor plate, and in high temperature alloys for defense products.

During the period, total sales amounted to 1.3 million pounds, valued at \$2.3 million, of which 748,820 pounds were sold under PL 89-413 pursuant to BDSA allocations and 600,843 pounds under PL 90-151 as off-the-shelf items. Practically all sales were made during the last five weeks of 1967.

Rubber

The international rubber situation has continued to exert downward pressures on sales and prices during the past six months. The U. S. Government, in response to the strong protests from producing countries, reduced the rate of disposals effective June 1967, from 120,000 long tons annually to actual Govern-

ment-use programs or to a maximum of 70,000 long tons annually, whichever is higher. Sales during the period amounted to 36,935 long tons, valued at \$14.5 million, as compared with 59,958 tons, valued at \$27.0 million, during January-June 1967. All sales in the report period were for Government-use programs including the Department of Defense truck and aircraft tires, retreading, and foreign AID programs. Under the restricted sales policy, it is unlikely that any stockpile rubber will be available in the near future for commercial purposes as Government-use programs are expected to exceed the 70,000 long tons available annually under the present program.



Smoked and dried rubber is wheeled from smokehouse in Malaysia.

Silver

Under Public Law 90-29 enacted June 24, 1967, the Secretary of the Treasury was authorized to release for sale the silver reserve requirements for silver certificates (not exceeding \$200,000,000) which are not expected to be presented for redemption. The Act provided that after one year following its enactment, all silver certificates will retain their monetary value but will not be redeemable for silver. A further provision of the Act requires that the Secretary of the Treasury, upon expiration of one year after the date of enactment, shall transfer not less than 165,000,000 fine troy ounces of silver to the National Stockpile—the amount established as the stockpile objective on June 3, 1965.

On July 14, 1967, the Treasury Department stated that it was ending its policy of selling silver at \$1.29 an ounce and that the General Services Administration would carry out sales in the future.

The GSA announced a sales program which provided for weekly sales under sealed bids for an indefinite period. Subsequent to the first opening on August 4, weekly offerings were planned at 2 million fine troy ounces of silver of which 1,700,000 ounces were to be open to bidding by both large and small business concerns (category A) and 300,000 ounces were to be open only to small business consumers (category B). Quantities of silver not sold in any weekly offering will be added to material offered for sale in subsequent weeks.

Between August 4 and December 31, 1967, a total of 43,151,860 ounces of silver, valued at \$77.3 million, was sold.

Tin

Due to an increased supply of tin created primarily by major producing countries continuing production at levels higher than war-

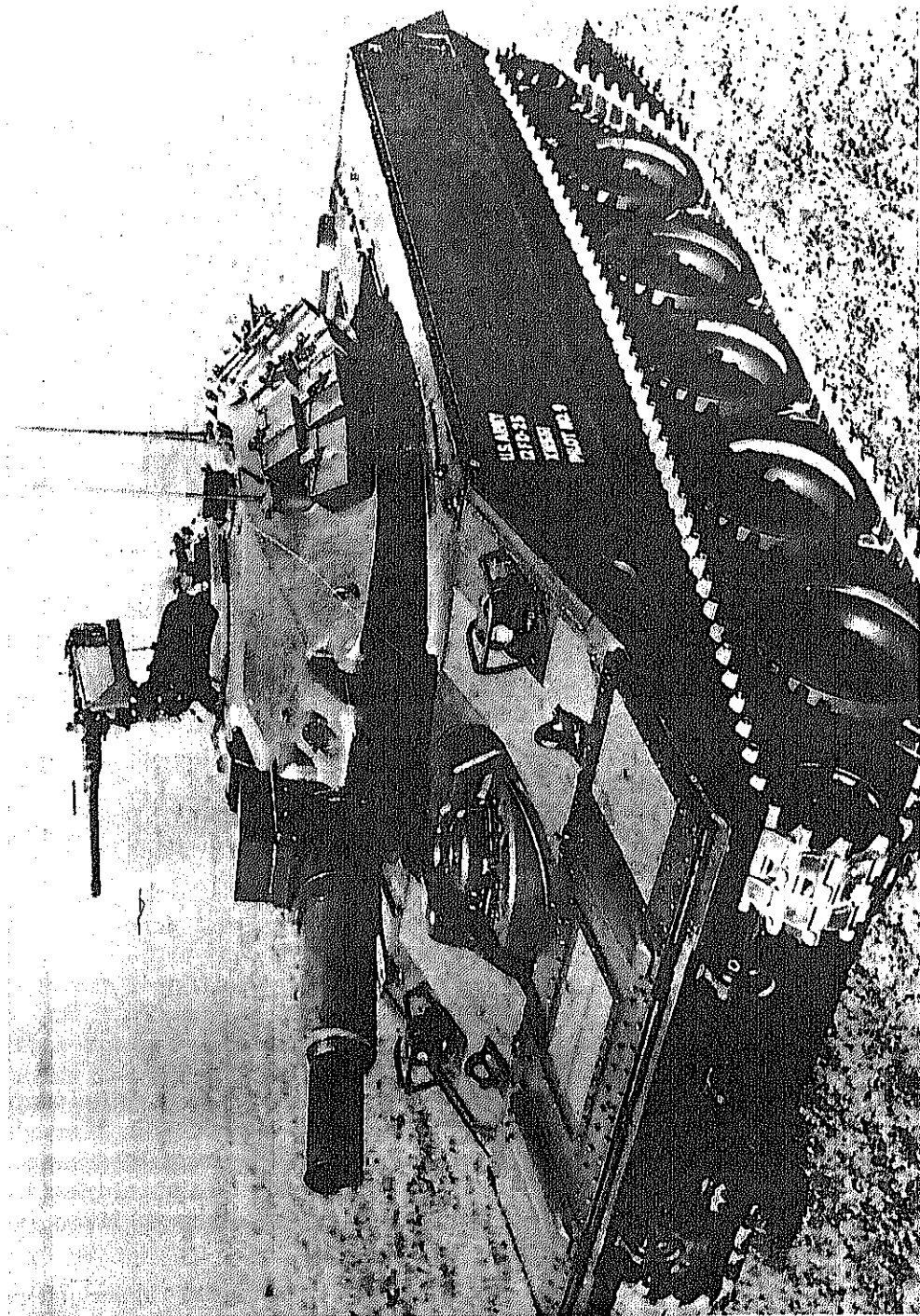
ranted by world consumption, the demand for Government tin declined. Sales were at an all time low for any six months report period since tin disposals were initiated in September 1962, totaling only 1,575 long tons, valued at \$5.4 million, compared with 4,564 tons, valued at \$15.8 million, for the six months ending June 30, 1967, and 7,159 tons, valued at \$24.7 million, for the last six months of 1966. Over the 5-year period, approximately 87,378 long tons of tin have been sold from the National Stockpile at a sales value of \$301.8 million and 3,930 long tons, valued at \$10.6 million, from the Federal Facilities Corporation inventory. As of December 31, 1967, 60,636 tons remain available for disposal under Congressional authorization.

Tungsten

The tight supply situation evidenced throughout the world for tungsten during most of fiscal year 1967 eased considerably in the last six months. Due to the high consumption rate in the first half of calendar year 1967, users purchased 5.4 million pounds, valued at \$13.3 million, from the Defense Production Act inventory to supplement their requirements. During July-December, however, consumer demand dropped materially with sales totaling slightly over 1.0 million pounds returning \$2.6 million. GSA plans to continue to offer tungsten as a shelf-item on an unrestricted basis.

Zinc

Sales of zinc during July-December amounted to 11,493 tons, valued at \$3.3 million, of which 11,337 tons were sold to Indian firms under the AID program, 98 tons to other Government-use programs, and 58 tons to others. The sales to India were a part of the contractual arrangement entered into by GSA in November 1967 for the delivery of approximately 20,000 tons, valued at \$5.0 million.



Armored Tank—A user of magnesium alloys.

ACTIVITIES OF THE GENERAL SERVICES ADMINISTRATION RELATING TO STOCKPILING OF STRATEGIC AND CRITICAL MATERIALS

The General Services Administration is charged with the general operating responsibility, under policies set forth by OEP, for stockpile management, including (1) purchasing and making commitments to purchase, transferring, rotating, upgrading, and processing of metals, minerals, and other materials; (2) expansion of productive capacity through the installation of additional equipment in Government-owned plants and the installation of Government-owned equipment in privately-owned facilities; (3) stor-

age and maintenance of all strategic materials held in Government inventories; and (4) disposal of excess stockpile materials, including the development of disposal plans, selling the materials and providing for Government-use of such materials.

The activities of the General Services Administration particularly in connection with procurement, upgrading, and disposals have been summarized in the earlier sections of this report.

STORAGE AND MAINTENANCE

On December 31, 1967, approximately 47.5 million tons of strategic materials were stored at 144 locations, as shown below.

Type of Facility	As of 12/31/67	Change in last 6 months
Military depots	36	-4
GSA depots	30	+1
Other Government-owned sites	16	+1
Leased commercial sites	14	
Industrial plantsites	39	
Commercial warehouses	9	-2
TOTAL	144	-4

A total of 270,000 tons was shipped from depots during the report period. This compares with 541,000 tons shipped during the previous six-month period.

Custody of stockpile materials stored at the Naval Supply Depot, Bayonne, New Jersey; the Marietta Air Force Station, Marietta, Pennsylvania; and the Black Hills Army Depot, Igloo, South Dakota; was transferred to GSA. These facilities have been inactivated by the Department of Defense. In addition, an

Army facility in Vicksburg, Mississippi, and two commercial warehouses in Massachusetts were evacuated by sale of remaining stocks and remaining quantities of valueless thorium residues at Weldon Springs, Missouri, were abandoned.

A total of 10,000 tons of rubber and cordage fiber was removed from commercial warehouses, primarily through the sales program, thus reducing annual storage cost by \$87,000.

ACTIVITIES OF THE DEPARTMENT OF COMMERCE RELATING TO STOCKPILING OF STRATEGIC AND CRITICAL MATERIALS

RESPONSIBILITIES

The Department of Commerce has been delegated a number of responsibilities with regard to the National Stockpile and these in turn have been assigned to the Business and Defense Services Administration within the Department. BDSA prepares for the Office of Emergency Planning estimates of essential civilian and war-supporting requirements for strategic materials in a mobilization period, a basic element in determining stockpile objectives. In certain limited cases, it also prepares estimates of the mobilization supply of such materials. It reviews plans for disposal of surplus stockpile materials and it provides OEP or GSA with its evaluation of the market impact of proposed schedules of sales. In addition, it develops recommendations in the matter of purchase specifications and storage procedures. It also prepares special studies for OEP regarding strategic material problems and, in general, submits to OEP on behalf of the Department recommendations or advice on stockpile policies and programs.

ESSENTIAL CIVILIAN AND WAR-SUPPORTING REQUIREMENTS

The principal development in the stockpiling program during the second half of 1967 was the initiation of the schedule of review of mobilization requirements for all items in the National Stockpile. For this purpose, OEP had prepared a series of guidelines including an economic model for the mobilization period projecting major segments of the economy into the assumed war period, a projection of requirements for controlled materials and the level of wartime activity of 64 sectors of the industrial complex. The schedule itself which was approved by OEP provided for completion of all reviews by the end of the first half of 1968 with the majority of them being finished by January 1968. Beginning in August and through December 1967, 17 reviews were submitted to OEP and 26 more were put under way.

Those completed included the following:

Beryl	Manganese ore,
Celestite	metallurgical
Chromite,	grade
metallurgical grade	Molybdenum
Cobalt	Palladium
Corundum	Quartz crystal
Fluorspar,	Rhodium
metallurgical grade	Rutile
Jewel bearings	Talc
Manganese ore,	Titanium
battery grade	Vanadium

DISPOSAL PROGRAMS

By mid-1966, long range-disposal plans for most of the surplus strategic materials in Government inventories had been approved and Congressional authorization, where necessary, had been obtained. These programs provided for rates of sales and methods of sale on an annual basis but with expectation of continuance if circumstances remained the same. For this reason, BDSA recommendations regarding the potential impact on the market of stockpile sales were limited to those items where a changed situation indicated the need for a possible modification of the offering arrangements. In this respect, the following materials were covered:

Beryl	Mica
Columbium	Molybdenum
Diamond, industrial:	Ruthenium
bort	

STOCKPILE PURCHASE SPECIFICATIONS AND SPECIAL STOCKPILE INSTRUCTIONS

The program for updating stockpile Purchase Specifications and Special Stockpile Instructions continued at a moderate pace. Drafts of nine revisions (four purchase specifications and five special instructions) were submitted to OEP. Twelve more are under way and proposed revisions for these should

be completed by the end of the next quarter. At the same time another 14 are being studied. Draft revisions for the following materials were sent to OEP during the period under review.

Purchase Specifications

Beryl
Diamond stones
Rutile
Tantalum

Special Instructions

Beryl
Chromite, metallurgical grade
Diamond stones
Graphite, natural (other than
Ceylon and Malagasy)
Silver

HIGH-HEAT ALLOY AND SPECIAL PROPERTY MATERIALS

BDSA's annual review of the prospective supply-requirements situation in wartime of certain high-heat alloy and special property materials was completed in November 1967 and a report sent to OEP. Under standard instructions, the study was directed primarily to the effect of technological developments and industry usage which could result in a wartime supply-demand deficit of materials capable of being stockpiled over a period of time. As required, calculations were based on reasonably firm requirements. Using this criterion, it was found that although some might be affected by supply difficulties none of the items reviewed would be sufficiently short in wartime to warrant stockpiling or a stockpiling analysis. The following materials were covered:

Beryl	Hafnium
Boron (elemental)	Silicon (high purity)
Cerium	Rhenium
Cesium	Rubidium
Columbium	Tantalum
Gallium	Tellurium
Germanium	Titanium
Graphite (artificial-special grades)	Zirconium

SPECIAL STOCKPILE STUDIES AND RELATED ACTIVITIES

In addition to the above regularly programmed work, BDSA prepares special studies for OEP bearing on stockpile problems and carries out assignments related to the stockpile operation. During the last half of 1967, the following work was done:

Listings of Consumers of Stockpile Items.—BDSA continued to supply OEP with lists of consumers of certain stockpile items including the names, addresses, and consuming pattern of each firm. Materials covered included castor oil, chestnut tannin, gum opium, morphine sulphate, rubber, sperm oil, quebracho tannin, and wattle tannin.

Copper.—On December 1, 1966, the President authorized the release of 150,000 short tons of copper from the National Stockpile. By direction of OEP, BDSA developed an allocation program under which instructions were given to GSA regarding sales and monthly shipments to nine domestic producers of refined copper from domestic ores, who would resell the copper to fill defense-rated orders only. At the beginning of the second half of 1967, 33,400 tons remained of the original 150,000 tons. The shipments totaled 19,100 tons in July, 7,600 tons in August, and 6,700 tons in September, thereby completing allocation of the entire amount.

Molybdenum.—In May 1966, Congress authorized the release and sale of 14 million pounds of surplus molybdenum (in concentrates and oxide) from the National Stockpile. Because of the tight supply situation, OEP directed GSA to sell the material only in accordance with allocations by BDSA and instructed BDSA to allocate the material only for defense orders and for hardship cases, particularly those involving small businesses. To ascertain the degree of hardship, BDSA obtained applications from consumers which set forth the relationship of orders to the prospective supply and existing inventories.

By early 1967, it was clear from the applications that the supply situation had eased and by June 30, 3,200,000 pounds remained to be distributed. At that time, strikes affecting an important producer and the plant of the

major processor imperiled the supply and it was decided to hold the remainder for defense orders until the strikes were over.

With the termination of the strike at the processor's plant in December, it was found that by January there would be ample supplies of both molybdenum concentrates and molybdenum oxide. Accordingly, OEP instructed BDSA to continue allocations but to use less strict criteria in determining the allocations, i.e., more on the basis of general need or convenience. Under this criterion, 700,000 pounds of oxide were allocated in December.

Meanwhile, in November, Congress approved the release and sale of an additional 15 million pounds of surplus molybdenum concentrates which contributed to the availability of this form of the material and which, therefore, is being sold on a shelf-item basis.

Cobalt Metal Powder.—Fine cobalt metal powder is essential for the production of tungsten carbide, a highly strategic material used for cutting tools, mining bits, and ammunition. Because of a question regarding the availability of such cobalt powder in wartime, BDSA undertook, at the request of OEP, a study of the situation. Visits to plants of domestic carbide producers to ascertain the usability of various grain sizes, discussions regarding the types of powders which could be produced here, analyses of particle size distribution, and consultations on the storage-ability of such fine powder resulted in the accumulation of considerable data bearing on the problem. Analysis of these data, together with further information being made available, should result in a final recommendation in the next quarter regarding the need for stockpiling the material.

ACTIVITIES OF THE DEPARTMENT OF STATE RELATING TO STOCKPILING OF STRATEGIC AND CRITICAL MATERIALS

The Department of State provides advice and guidance regarding the effects of stockpiling program activities on U.S. foreign relations, and deals with problems in this area which may arise out of these activities. The Department participates with other agencies in the periodic review of the supply and demand situation for each of the stockpiled materials and in the development of related stockpile objectives. The Department provides the estimate of reliability of foreign sources of supply in time of national emergency.

In regard to the disposal of surplus materials from the stockpile, the Department shares in the development of disposal plans suited to the particular situation in each material and conducts consultations with interested foreign governments regarding each plan. Based on these consultations, an evaluation is made of the political and economic effects of disposals on friendly foreign countries and on foreign relations of the United States. As necessary, recommendations are made for the adoption or modification of the

proposed disposal plans. The Department participates in the review of proposals in case of barter of U.S. surplus agricultural products involving strategic materials, and assists in advising the Department of Agriculture on foreign policy problems rising from the conduct of barter programs.

During the period July-December 1967 consultations and discussions were held with interested Governments on several stockpiled materials. Primary attention, however, was centered around the surplus rubber disposal program. The continuing downward trend to an 18-year low in the price of natural rubber caused great concern among Governments of rubber growing countries. Despite the reduction from 120,000 to 70,000 tons which became effective on July 1 in the annual rate of disposal of U.S. surplus rubber, these Governments considered the disposal a significant depressing factor on the market. In early October, in response to the Malaysian Cabinet's concern over the declining prices,

the Malaysian Finance Minister came to Washington. During his visit he discussed the rubber problem with the President and had a series of meetings with top officials of the Department and other agencies. These discussions laid the basis for a continuing dialogue on the subject and led to a better understanding of the U.S. position in the matter. This

became quite evident during December when the Department sent a delegation to special meetings on the rubber problem called by the International Rubber Study Group and by the UN Committee for Trade and Development. At neither of these meetings was a serious proposal made for further reduction in the U.S. rubber disposal program.

ACTIVITIES OF THE U.S. DEPARTMENT OF AGRICULTURE RELATING TO STOCKPILING OF STRATEGIC AND CRITICAL MATERIALS

EXPANSION OF DOMESTIC SOURCES

Drug Plant Seeds. Seed stocks of *Atropa belladonna*, *Digitalis lanata*, *Digitalis purpurea* and *Papaver somniferum* are being maintained at the National Seed Laboratory. Quantities and germination are approximately the same as previously reported. The stocks are considered sufficient to meet minimum national production needs in the event of a defense emergency. Stocks will be rejuvenated periodically when they reach a critical stage of low viability.

Castorbeans. For the second consecutive year, a hail storm damaged the experimental castorbean plantings. During July-December 1967, activities were limited to taking field observations, recording data, harvesting plots, weighing seed, and evaluating data from research.

COTTON TRANSFERRED FROM STOCKPILE FOR DISPOSAL

Sales of domestic grown extra-long staple cotton in the National Stockpile inventory continued during the report period. As of December 31, 1967, this inventory had been reduced to 31,974 bales.

WOOD

continuing. Reduced loss and damage to

manufactured goods and agricultural products and savings from reductions in overdesign will result from tests devised to determine the strength of corrugated fiberboard. Increasing the wet strength of container fiberboards is under investigation. A method involving polymerizing resin-treated paperboards shows promise for commercial box manufacturing and is estimated to be less costly than some other methods. Such findings can be advantageous in the handling of materials in the National Stockpile.

BARTER ACTIVITIES

No barter contracts for strategic materials for subsequent transfer to the Supplemental Stockpile were signed during the July-December 1967 period.

In September 1967, the Department of Agriculture revised its policy on bartering for strategic materials for stockpiling. Under the new policy, stockpile materials will, in general, be acquired through barter of agricultural commodities only when the Commodity Credit Corporation can be reimbursed for those materials by funds appropriated to the agency responsible for National Stockpile procurement.

This general policy on use of barter only when the materials would otherwise be procured for dollars is consistent with the objective of the barter program to benefit the balance of payments.

There may still be unusual circumstances in which barter for materials in excess of Na-

tional Stockpile objectives will be in the best interest of the United States. In these exceptional cases there will be prior consultation with the Department's Supplemental Stockpile Advisory Committee for Barter.

Strategic materials valued at \$18.6 million were delivered to the Commodity Credit Corporation during July-December 1967 bringing the cumulative total of deliveries to CCC since 1950 to approximately \$1.6 billion. Of this total, \$223.3 million were transferred to the National Stockpile and about \$1.4 billion

to the Supplemental Stockpile through December 31, 1967.

PURCHASE OF STRATEGIC AND CRITICAL MATERIALS

With the enactment of Public Law 89-808 (effective January 1, 1967), authority contained in section 104(b) for the utilization of foreign currency accrued under Title I agreements for purchase of strategic or other materials for the Supplemental Stockpile was discontinued.

ACTIVITIES OF THE DEPARTMENT OF THE INTERIOR RELATING TO STOCKPILING OF STRATEGIC AND CRITICAL MATERIALS

The Department of the Interior is responsible for the management, conservation, and development of the Nation's natural resources to meet the requirements of national security and an expanding economy. The Department provides advice and assistance to the Office of Emergency Planning in formulating and carrying out programs for the stockpiling of strategic and critical materials. The Department of the Interior conducts research in exploration, mining, beneficiation, and metallurgy and compiles information on production and consumption for use in stockpile planning.

The Department is responsible for emergency preparedness planning with respect to strategic metals and minerals and other resources, and conducts supply-requirements studies when market conditions or other circumstances indicate problem areas in which materials are likely to be in short supply and recommends appropriate action to overcome deficiencies. The Department also administers programs to encourage the exploration, development, and mining of minerals and metals for emergency purposes.

STOCKPILE DISPOSALS

The Department cooperates in the development of long-range programs for the disposal of surplus Government stockpile inventories

and conducts consultations with representatives of the interested industries. The industry views along with analyses of the market situation are carefully considered in the development of Departmental recommendations for acceptance or modification of the proposed plans.

RUTILE RESEARCH PROGRAM

Under the Domestic Rutile Expansion Program established by the OEP, the Bureau of Mines initiated a comprehensive investigation of processes, which are under development by industry, for producing substitutes for natural rutile from domestic and nearby sources of ilmenite. The Bureau also was studying the industry potential for direct use of currently available substitutes, such as ilmenite, manufactured titanium dioxide, and titanium slag.

OTHER ACTIVITIES

Utah bertrandite deposits are to be worked commercially for beryllium in 1969. The Brush Beryllium Co., Cleveland, Ohio, announced plans to obtain part of its beryllium requirements from its bertrandite deposits in the Topaz-Spor Mountain area of Utah. The company will erect an extraction plant at Delta to process ore from its mines about

40 miles away. The facilities are expected to cost about \$9 million. This is the first time that large quantities of beryllium will originate from bertrandite instead of all from beryl, particularly imported beryl.

Bureau of Mines metallurgists continued studies on the extraction of beryllium by the sodium reduction of beryllium chloride and by the electrolysis of beryllium oxide.

A method of simultaneous determination of platinum and palladium with a detection limit of 10 ppb of either metal in a 10-gram sample has been developed by Geological Survey chemists. The procedure is long and complex, but in the sequential method used, gold and rhodium can also be determined in their respective fractions. The method is now

in use in geochemical studies connected with the Geological Survey's Heavy Metals program.

A new method for spectrochemical determination of platinum, palladium, and rhodium uses direct spectrographic analysis of metallic gold beads obtained by preliminary fire-assay concentration. This development is a major breakthrough as previous methods depending on spectrochemical analysis of metallic beads have proved unreliable. The new method is simple enough to permit limited reconnaissance studies.

Special and technical reports, issued during July-December 1967, having a relationship to strategic and critical materials are as follows:

BUREAU OF MINES

Reports of Investigation

- 6984 Purification of Tungsten Hexachloride
- 6988 Study of Columbium-Base Alloys
- 6982 Continuous Flotation of Fluorspar From a Calcareous Illinois Ore
- 6996 Fracturing a Deposit With Nuclear Explosives and Recovering Copper by the In-Situ Leaching Method
- 6998 Reaction of Tungsten-Cobalt Alloys With Oxygen at 1,000° and 1,100° K
- 6999 Electric Smelting of Complex Lead-Zinc Sinter
- 7001 Thermodynamic Properties of Three Lithium-Aluminum Silicates
- 7005 Reaction Rates of the Titanium-Oxygen Alloy System and Titanium Chlorides in Molten Sodium Chloride
- 7008 Reaction Rate of Solid Yttrium Metal With Molten Lithium Fluoride
- 7014 Electron-Beam Purification of Vanadium
- 7016 Electrodeposition of Thick Coatings of Platinum and Palladium on Refractory Metals From Aqueous Electrolytes
- 7021 Process Development in Removing Sulfur Dioxide From Hot Flue Gases (in Four Parts). 3. Pilot Plant Study of the Alkalized Alumina System for SO₂ Removal
- 7023 Electrodeposition of Iridium From Fused Sodium Cyanide and Aqueous Electrolytes
- 7026 Thermodynamic Data for Cuprous and Cupric Oxides
- 7035 A Study of Heat Transfer to Water-Cooled Copper Crucibles During Vacuum Arc Melt-

ing Vanadium Scrap
ium-Iron Alloys and Titanium Trichloride in Molten Sodium

Blast Furnace Matte

Coal
ising

Information Circulars

- 8835 Potential Sources of Aluminum
- 8839 Fluorspar in the Eastern United States
- 8840 Selenium and Tellurium, A Materials Survey
- 8851 Magnetic Susceptibility of 19 Nickel—and Cobalt-Bearing Minerals

Bulletin

- B641 Optical Properties of Coals and Graphite

Journal Articles

- OP 5-67 Manganese Recovery as Chloride From Ores and Slags (Min. Eng., v. 19, No. 3)
- OP 47-67 Chromium, Molybdenum, Nickel, and Tungsten as Automotive Metals (SAE Preprint 670121)
- OP 57-67 Considerations of Solvent Extraction Processing of U.S. Beryllium Ores (Solvent Extractions Chemistry of Metals, Proc. International Conf., UKAEA, 1965)
- OP 58-67 Space Age Metals (Min. Cong. J., v. 52, No. 2)
- OP 68-67 Electrorefining Vanadium (J. Metals, v. 17, No. 1)
- OP 82-67 Phase Relations in the ZrO_2 - MgO System (J. Am. Ceram. Soc., vol. 50, No. 6)
- OP 100-67 Phase Equilibria in the System GeO_2 - Al_2O_3 , (J. Am. Ceram. Soc., v. 50, No. 5)
- OP 117-67 Hexagonal Diamonds in Meteorites (Science, v. 156, No. 3787)
- OP 131-67 A Method for Mica Determination by Heavy Liquid Separation (Trans. SME, Sept. 1967)
- OP 138-67 Ternary Phases in the System MgO - GeO_2 - LiF (J. Am. Ceram. Soc., v. 50, No. 8)
- OP 153-67 Transverse and Longitudinal Optical Properties of Graphite (Carbon, v. 5, September 1967)
- OP 168-67 Reaction of Coal and Graphite in a Micro-wave Discharge in H_2O and D_2O (Chem. and Ind., No. 29)
- OP 172-67 Electroslag Melting of Titanium and Molybdenum (In Proc. 1st Internat. Symp. on Electroslag Consumable Electrode Remelting and Casting Technology, Mellon Institute, Pittsburgh, Pa., Aug. 9-10, 1967)
- OP 181-67 Methods for Producing Alumina From Clay—An Evaluation (J. Metals, v. 19, No. 10)
- OP 86-67 Recovery of Uranium From Uranium Mine Waters and Copper Mine Waste Dump Leaching Solutions (Panel on Processing of Low-Grade Uranium Ores, International Atomic Agency, Vienna, Austria, June 27-July 1, 1966)

U.S. GEOLOGICAL SURVEY

Professional Papers

- 530 The geologic occurrence of monazite, by W. C. Overstreet (rare earths).
- 555 General geology of Santa Rita quadrangle, Grant County, New Mexico, by W. R. Jones, R. M. Hernon, and S. L. Moore (copper, zinc).
- 557 Geology of the Connors Pass quadrangle, Schell Creek Range, east-central Nevada, by Harold Drewes (silver, gold, copper, lead, zinc, antimony, tungsten).
- 558 The Ore Knob copper deposit, North Carolina, and other massive sulfide deposits of the Appalachians, by A. R. Kinkel, Jr.

575-A, C, D

Geological Survey Research 1967, Chapters A, C, and D. Short papers on economic geology, analytical methods, and related subjects.

Bulletins

1185-D

The Morro do Ferro thorium and rare-earth ore deposit, Pocos de Caldas district, Brazil, by Helmuth Wedow, Jr.

1227

Geology of the Mount Wilson quadrangle, western San Juan Mountains, Colo., by C. S. Bromfield (gold, silver, lead, copper, zinc).

1281

Geology and ore deposits of the Lawson-Dumont-Fall River district, Clear Creek County, Colorado, by C. C. Hawley and F. B. Moore (gold, silver, lead, zinc).

1237

Geology and ore deposits of the Philipsburg district, Granite County, Montana, by W. C. Prinz (silver, zinc, manganese).

1246

Metalliferous lode deposits of Alaska, by H. C. Berg and E. H. Cobb.

Circular

549

Economic significance of revised age relations of rocks in the Cornucopia mining district, Elko County, Nevada, by R. R. Coats (silver, gold).

Maps

MR-47

Reported occurrences of selected minerals in the northern third of California, compiled by M. B. Smith, V. L. Engler, D. I. Lee, and R. G. Wayland (antimony, copper, molybdenum, etc.).

MR-50

Reported occurrences of selected minerals in Montana, compiled by C. B. Bentley and G. D. Mowat (aluminum, copper, etc.).

TOTAL OBLIGATIONS AND EXPENDITURES OF STOCKPILING FUNDS
Under PL 117 and PL 520 for THE NATIONAL STOCKPILE
CUMULATIVE AND BY FISCAL PERIOD THROUGH DECEMBER 31, 1967

Fiscal Period	OBLIGATIONS INCURRED ^A		EXPENDITURES ^B	
	Net Change By Fiscal Period	Cumulative As of End of Period	By Fiscal Period	Cumulative As of End of Period
Prior to Fiscal Year 1948	\$ 123,871,685	\$ 123,871,685	\$ 66,330,731	\$ 66,330,731
Fiscal Year 1948	252,901,411	376,773,096	82,907,575	149,238,306
Fiscal Year 1949	459,766,881	836,539,977	304,486,177	453,724,483
Fiscal Year 1950	680,427,821	1,516,967,798	440,834,970	894,559,453
Fiscal Year 1951	2,075,317,099	3,592,284,897	655,537,199	1,550,096,652
Fiscal Year 1952	948,117,547	4,540,402,444	844,683,459	2,394,780,111
Fiscal Year 1953	252,375,163	4,792,777,607	906,158,850	3,300,938,961
Fiscal Year 1954	116,586,681	4,909,364,288	644,760,321	3,945,699,282
Fiscal Year 1955	321,799,833	5,231,164,121	801,310,094	4,747,009,376
Fiscal Year 1956 ^C	251,692,667	5,482,856,788	382,011,786 ^C	5,129,021,162 ^C
Fiscal Year 1957	190,000,109	5,672,856,897	354,576,558	5,483,597,720
Fiscal Year 1958	54,473,250	5,727,330,147	173,753,997	5,657,351,717
Fiscal Year 1959	38,710,379	5,766,041,026	65,280,098	5,722,611,815
Fiscal Year 1960	19,859,290	5,785,900,316	49,227,142	5,771,838,957
Fiscal Year 1961	29,082,919	5,814,983,235	33,325,431	5,805,164,388
Fiscal Year 1962	31,179,407	5,846,162,642	33,695,431	5,838,859,819
Fiscal Year 1963	17,414,900	5,863,577,542	22,104,176	5,860,963,995
Fiscal Year 1964	15,489,597	5,879,067,139	16,091,067	5,877,055,062
Fiscal Year 1965	16,288,732	5,895,355,871	16,561,275	5,893,616,337
Fiscal Year 1966	16,296,070	5,911,651,941	16,468,100	5,910,084,437
Fiscal Year 1967	18,197,410	5,929,849,351	17,981,675	5,928,066,112
Fiscal Year 1968—First Half	6,946,529	5,936,795,880	7,661,696	5,935,727,808

SOURCE: GENERAL SERVICES ADMINISTRATION

^A Figures are the sum of obligations incurred under PL 520, 79th Congress and PL 117, 76th Congress.

Final obligations under PL 117, 76th Congress were incurred in Fiscal Year 1949.

^B Figures are the sum of expenditures under PL 520, 79th Congress and PL 117, 76th Congress.

Final expenditures under PL 117, 76th Congress were made in Fiscal Year 1951.

^C 1956 and subsequent fiscal periods and cumulative expenditures are reported on an accrual basis.

STATUS OF OBLIGATIONAL OPERATIONS

Under PL 117 and PL 520

As of December 31, 1967

AUTHORITY	AUTHORIZATIONS FOR			OBLIGATIONAL AUTHORITY (CUMULATIVE) ^d
	APPROPRIATED FUNDS ^a	ADVANCE CONTRACTS ^b	LIQUIDATING ADVANCES ^c	
Under PL 117—76th Congress				
PL 361—76th Congress, August 9, 1939	\$ 10,000,000	\$		\$ 10,000,000
PL 442—76th Congress, March 25, 1940	12,500,000			22,500,000
PL 667—76th Congress, June 26, 1940	47,500,000			70,000,000 ^e
Under PL 520—79th Congress				
PL 663—79th Congress, August 8, 1946	100,000,000	—	—	100,000,000
PL 271—80th Congress, July 30, 1947	100,000,000	75,000,000	—	275,000,000
PL 785—80th Congress, June 25, 1948	225,000,000	300,000,000	—	800,000,000
PL 785—80th Congress, June 25, 1948	75,000,000	—	75,000,000	800,000,000
PL 119—81st Congress, June 23, 1949	40,000,000	270,000,000	—	1,110,000,000
PL 150—81st Congress, June 30, 1949	275,000,000	250,000,000	—	1,635,000,000
PL 150—81st Congress, June 30, 1949	250,000,000	—	250,000,000	1,635,000,000
PL 434—81st Congress, October 29, 1949	—	—	100,000,000 ^f	1,535,000,000
PL 759—81st Congress, September 6, 1950	365,000,000	—	240,000,000	1,660,000,000
PL 759—81st Congress, September 6, 1950	240,000,000	125,000,000	—	2,025,000,000
PL 843—81st Congress, September 27, 1950	573,232,449 ^g	—	—	2,598,232,449
PL 911—81st Congress, January 6, 1951	1,834,911,000	—	—	4,433,143,449
PL 253—82nd Congress, November 1, 1951	590,216,500	—	—	5,023,359,949
PL 253—82nd Congress, November 1, 1951	200,000,000	—	200,000,000	5,023,359,949
PL 455—82nd Congress, July 25, 1952	203,979,000	—	70,000,000	5,157,338,949
PL 176—83rd Congress, July 31, 1953	—	—	30,000,000	5,127,338,949
PL 428—83rd Congress, June 24, 1954	—	—	27,600,000	5,099,738,949
PL 663—83rd Congress, August 26, 1954	379,952,000 ^h	—	—	5,479,690,949
PL 112—84th Congress, June 30, 1955	321,721,000 ⁱ	—	—	5,801,411,949
PL 112—84th Congress, June 30, 1955	27,400,000	—	27,400,000	5,801,411,949
PL 844—85th Congress, August 28, 1958	3,000,000	—	—	5,804,411,949
PL 255—86th Congress, September 14, 1959	—58,370,923 ^j	—	—	5,746,041,026
PL 626—86th Congress, July 12, 1960	22,237,000 ^k	—	—	5,768,278,026

PL 741—87th Congress, October 3, 1962	8,729,887 ^m	—	—	5,793,690,423
PL 215—88th Congress, December 19, 1963	23,925,000	—	—	5,817,615,423 ⁿ
PL 507—88th Congress, August 30, 1964	9,319,168 ^o	—	—	5,826,934,591
PL 16 —89th Congress, April 30, 1965	118,500	—	—	5,827,053,091
PL 128—89th Congress, August 16, 1965	16,096,284 ^p	—	—	5,843,149,375
PL 555—89th Congress, September 6, 1966	18,493,789 ^q	—	—	5,861,643,164
PL 21 —90th Congress, May 29, 1967	244,000	—	—	5,861,887,164
PL 121—90th Congress, November 3, 1967	18,720,000 ^r	—	—	5,880,607,164
Total PL 117 and PL 520	\$5,950,607,164	\$1,020,000,000	\$1,020,000,000	\$5,950,607,164

SOURCE: GENERAL SERVICES ADMINISTRATION

- ^a Congressional appropriations of funds for stockpiling purposes.
- ^b Congressional appropriations of contracting authority for stockpiling purposes in advance of appropriation of funds.
- ^c Congressional authorizations to liquidate outstanding obligations incurred under previously granted advance contract authority.
- ^d Cumulative total of appropriated funds and advance contract authorization, less authorization to liquidate outstanding advance contract.
- ^e Excludes \$8,845,792 received from sale of stockpile materials for wartime consumption. Receipts were returned to Treasury, February, 1948.
- ^f Cancellation of previously authorized authority to make contracts.
- ^g Excludes \$25,404,921 transferred to operating expenses for rehabilitation of Government-owned material producing plants.
- ^h Excludes \$43,000 transferred to Transportation and Public Utilities Service, GSA.
- ⁱ Excludes \$430,000 transferred to Transportation and Public Utilities Service, GSA and \$199,349,000 transferred to General Fund Receipts on June 27, 1956—PL 623—84th Congress.
- ^j As of June 30, 1959, this amount included cash of \$52,350,792 and receivables of \$6,020,131.
- ^k Excludes \$7,763,000 transferred to other GSA Funds for classified and wage board salary increases during 1961.
- ^l Appropriation of \$40,000,000 of which \$22,700 transferred to Office of Administrator, GSA and \$23,294,790 transferred to General Fund Receipts.
- ^m Appropriation of \$18,095,000 less transfers to General Fund Receipts of \$9,365,113.
- ⁿ Excludes receipts from rotational sales.
- ^o Appropriation of \$17,755,000 less returns to Treasury of \$8,435,832.
- ^p Appropriation of \$17,400,000 less returns to Treasury of \$1,303,716.
- ^q Appropriation of \$19,847,000 less returns to Treasury of \$1,333,211.
- ^r Stock Piling portion of OE, PMDS appropriation.

EXPENDITURES OF STOCKPILE FUNDS, BY TYPE
(for the National Stockpile)

Cumulative and for First Half Fiscal Year 1968

Type of Expenditure	Cumulative Through June 30, 1967	Six Months Ended December 31, 1967	Cumulative Through December 31, 1967
Expenditures			
Gross Total	\$6,472,412,026	\$7,910,282	\$6,480,322,308
Less: Adjustments for Receipts from			
Rotation Sales and Reimbursements	544,345,914	248,586	544,594,500
Net Total	5,928,066,112	7,661,696	5,935,727,808
Materials Acquisition Costs, Total	5,438,574,358	89,817	5,438,664,175
Stockpile Maintenance Costs, Total	418,973,180	5,042,327	424,015,507
Facility Construction	43,772,457	—	43,772,457
Storage and Handling Costs	272,450,365	5,042,300	277,492,665
Net Rotation Costs	102,750,358	27	102,750,385
Administrative Costs	59,949,377	1,957,995	61,907,372
Operations, Machine Tool Program	10,568,697	571,557	11,140,254

Cumulative figures are the total of expenditures under PL 117, 78th Congress and PL 520, 79th Congress. Expenditures under PL 117 totaled \$70,000,000 of which \$65,625,237 was for materials acquisition costs and \$14,374,763 was for other costs. Final expenditures under PL 117 were made in FY 1961.

SOURCE: GENERAL SERVICES ADMINISTRATION

